Access Grid Node Management

Now that you have this bull, how you going to steer it?

FUTURESLAB

ACCESS GRID

Why Manage Nodes?

The GOAL: To make an AG Node a natural part of collaborative problem solving environments.

Sometimes you need to...

- turn down someone's audio at THE OTHER END
- turn the camera OVER THERE
- check the status of the OTHER NODE
- help debug a problem that's local TO THEM
- bring up an application, and have it everywhere
- know who can see and hear you
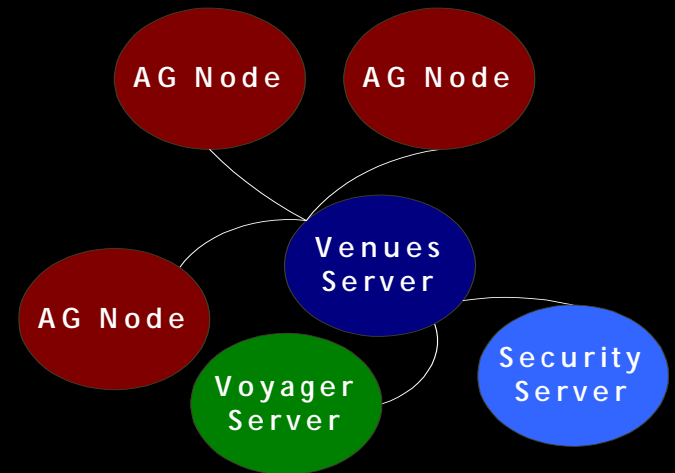- know when the next break in the meeting is
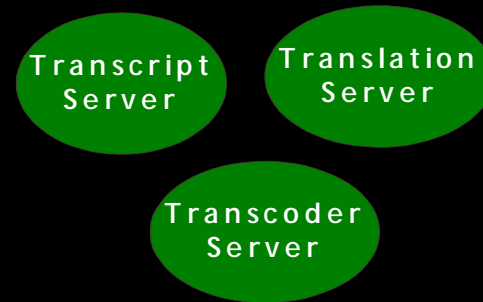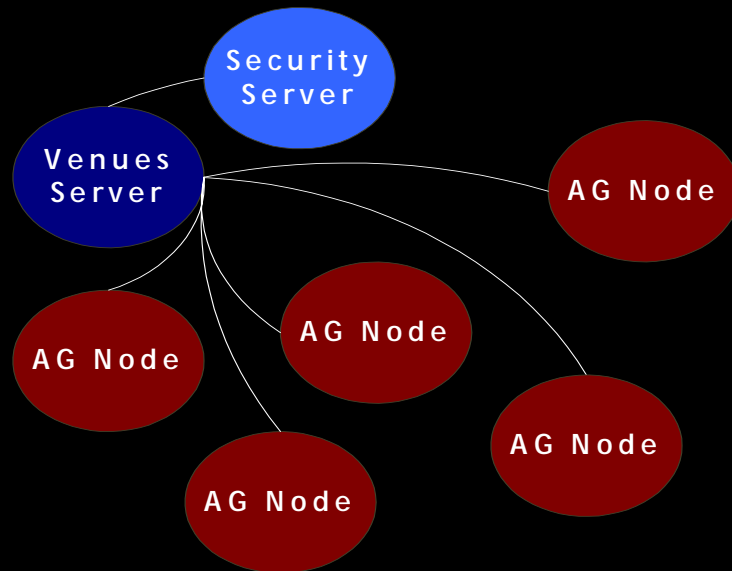
FUTURESLAB

ACCESS GRID

Information Needed

- The state of local and remote AG Nodes needs to be immediately discoverable.

- The state of an AG Meeting needs to be immediately discoverable.

- The software and hardware on local and remote nodes needs to be controllable in a simple and straightforward way.

- Node Ops, Event Producers, Technical Directors, and Emcees need a private back channel, distinct from the Venue Mud, for dealing with technical situations
  - The back channel may be audio or need to transcode from audio to and from text

Access Grid Entities

Security
Server

Venues
Server

AG Node

AG Node

AG Node

AG Node

AG Node

Transcript
Server

Translation
Server

Transcoder
Server

AG Node

AG Node

Venues
Server

AG Node

Voyager
Server

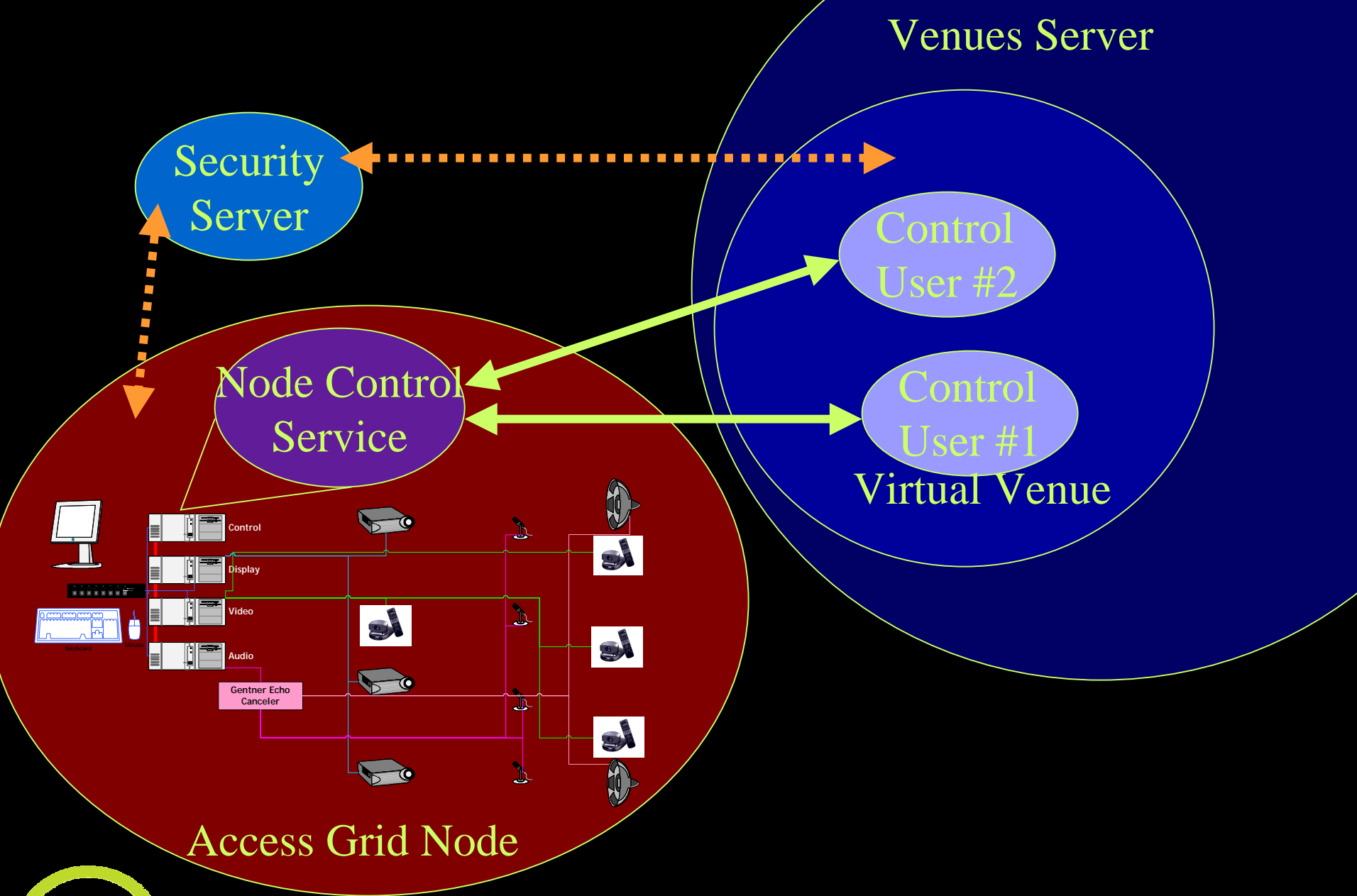Security
Server

FUTURESLAB

ACCESS GRID

The AG Node Control Service
Local and Remote access to AG Node Controls

- Static Configuration
  - Node Information
    - Graphics Capabilities
    - Network Connection
    - Video Capture Cards
    - Audio Capture Cards
    - Software Versions
  - Resource Labeling Data
    - Presenter Camera is control:/dev/ttyS0

- Dynamic Configuration
  - Current Node Operator
  - Current Venue
  - Current Docked Users
  - Current Audio Levels
  - Window Layout
  - Multicast connectivity quality among nodes in the same Venue

Venues Server

Security Server

Control User #2

Control User #1

Virtual Venue

Node Control Service

Control

Display

Video

Audio

Keyboard   Mouse

Gentner Echo Canceler

Access Grid Node

FUTURESLAB

AG Node Management

ACCESS GRID

AG Node Object Model
composable, extensible

- Cameras
  - Presenter Camera
    - Pan
    - Tilt
    - Zoom
  - Audience Camera Left
  - Audience Camera Right
  - Overview Camera
- Audio
  - Presenter Mic
    - Volume
    - Mute
  - Table Mic A
  - Table Mic B
  - Matrix Switch
    - Connect input A to output B
    - Set Gate Level to 4 on input 3

- Display surface
  - by Application
    - Video ("VIC")
    - Audio ("RAT")
    - Slideshow ("PPT")
    - BROWSER
  - by Window
    - ANL-A215 AUDIENCE
    - Microsoft PowerPoint
  - by Node
    - SDSC
      - Presenter Camera
        » Move left
- Docked Participant
  - Share Document
  - Private Text Message

FUTURESLAB

AG Node Management

ACCESS GRID

Things We Want to Use

- BlueTooth – RF Data Transfer, Ad-Hoc Networks
- IR Scurry – Infrared Data Transfer, Ad-Hoc Networks
- Sound Based Interaction – Voice to/from Text, Private communication
- Vision Based Interaction – User Identification, Laser Pointer Interfacing, Projector Geometry/Color Calibration and Setup
- Laptop Based Interaction – Data Wormholes, Application Control

Objects to Interfaces

- Simple Extensible API:
  - Hierarchical scopes, e.g.:
    - node.camera.presenter.move(left)
    - App("PPT").window.slave(dppt spec)

- Glue Framework
  - Message Bus – http://www.mbus.org/
    - Designed for inter-application communication via local multicast groups.
    - Code already incorporated into vic/rat, separate library also available from UCL.

Interfaces we already have but don't fully exploit

- Vic*, Rat*– Tcl send, Message Bus, RTCP
- Projectors, Gentner – Custom Serial Protocols
- Cameras – Sony VISCA
- GNOME, KDE, Star Office – CORBA
- MS Windows, MS Office* – COM/DCOM
- Crestron Control System – Web Server, Custom Touch Panels, TCP/IP Server
  - Projectors
  - Cameras
  - Gentner

  * software partially controlled thru one or more of the listed interfaces.

FUTURESLAB

ACCESS GRID

The Next Steps

- Node Configuration Work
  - Write configuration specification version 1.0.
  - Implement configuration database, based on 1.0 spec.
  - Write tools to dynamically keep the configuration database up-to-date.
- Service Objects – Implement service objects (v1.0) for
  - Cameras
  - Audio
  - Display Surface

Other Observations

- Every Venue needs a "Technical Back Room"
    - Node Operators hang out here during meetings
    - A room attached to the venue
    - Performance and Monitoring Information should be present in this room
- Venues Services and Control are a big issue
    - The Venues Service Model could be similar in architecture to the Node Control Service Model

References

- Service Location Protocol --http://www.ietf.org/html.charters/svrloc-charter.html
- Crestron Control Systems – http://www.crestron.com/
- Panja – http://www.panja.com/
- Message Bus – http://www.mbus.org/
- Internet Tool Survey – http://www.objs.com/survey/survey.htm
- ToolTalk – Sun Microsystems software that predated OMG CORBA
- CORBA – OMG Specification, http://www.omg.org/
- MICO – Open Source CORBA ORB, OMG Certified Compliant, http://www.mico.org/
- Sony EVI-D30 Documents/Software – http://www.world.sony.com/Electronics/ISP/dtp/index.html
- Vic,Rat,libcommon – http://www-mice.cs.ucl.ac.uk/multimedia/software/
- DevServ – http://www-itg.lbl.gov/mbone/devserv/